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(72) Inventors:
• The inventor has agreed to waive his entitlement to designation.

(74) Representative: Rapsardi, Mariacristina
Ufficio Brevetti Rapsardi S.r.l.,
Via Serbelloni, 12
20122 Milano (IT)

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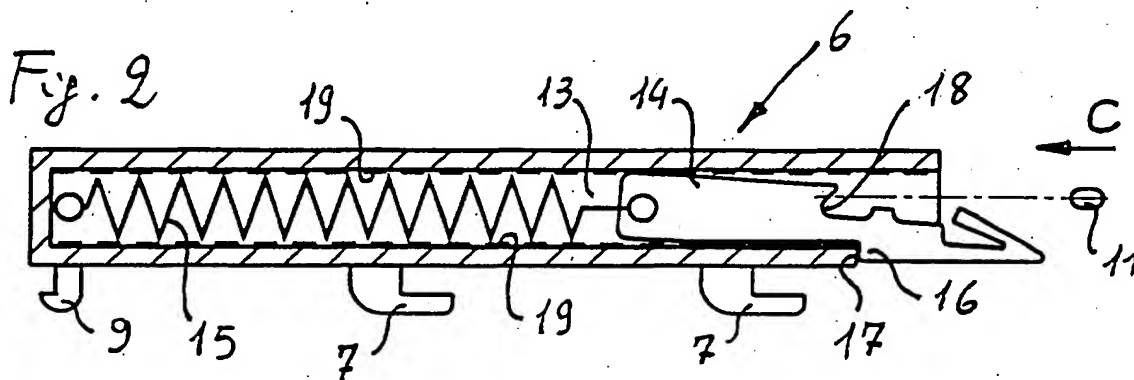
(71) Applicant: Arturo Salice S.p.A.
I-22060 Novedrate (Como) (IT)

(54) Decelerated closing device for sliding portions of pieces of furniture

(57) The present finding relates to a closing device for sliding portions of pieces of furniture, such as drawers and the like, consisting of a container fastened to the fixed or to the sliding portion of the piece of furniture wherein there are housed a mechanical energy accumulator and an actuation member that is sliding into a

guide of the container, and of a pulling member, respectively fastened to the other side of the piece of furniture, which interacts with the actuation member.

The actuation member is directly or indirectly slowed in its movement by a deceleration device based on the use of high-viscosity greases.



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Description

[0001] The invention relates to a closing device for sliding portions of pieces of furniture, such as drawers and the like, consisting of a container fastened to the fixed or to the sliding portion of the piece of furniture wherein there are housed a mechanical energy accumulator and an actuation member that is sliding into a guide of the container, and of a pulling member, respectively fastened to the other side of the piece of furniture, which interacts with the actuation member.

[0002] Closing devices applied to guides for drawers or to hinges for pieces of furniture are known, exhibiting deceleration systems for dampening the speed of the portions of pieces of furniture just before their closed position, so as to prevent annoying shocks and noise.

[0003] DE 198 35 466 discloses a deceleration device for drawers or the like, consisting of a container with mechanical energy accumulator and of a sliding actuation member interacting with a pulling pin housed at the other side of the piece of furniture, where between the energy accumulator and the actuation member there is interposed a deceleration device connected to the latter so as to increase friction when it is pushed by the same pulling pin.

[0004] Known deceleration devices exhibit a complex structure and they also require a high precision of implementation. They are therefore relatively expensive.

[0005] Thus, object of the invention is that of creating a closing device of the previously described type which should exhibit a cost-effective deceleration system easy to implement.

[0006] According to the invention, this object is achieved by the characterising details of claims 1 or 10.

[0007] In a first embodiment, the movement of the actuation member of the closing system is directly or indirectly slowed by a high-viscosity grease.

[0008] The grease used according to the invention is one of the known "Damping Greases" and can consist of high-viscosity base oils, of a tackifier polymer and of synthetic hydrocarbons exhibiting a very high viscosity index so as to provide a high inside resistance to motion.

[0009] According to a preferred embodiment, the high-viscosity grease is applied to the guiding walls of the container so as to exert its dampening or decelerating function in the interspace between the walls of the guide and the actuation member sliding inside it.

[0010] According to another embodiment of the invention, the actuation member exhibits a projecting part sliding into a special guide of the container provided with grease.

[0011] The walls of the container guide can be suitably provided with small projecting parts or grooves that prevent undesired movements of the grease.

[0012] As an alternative or in addition to the guide walls, also the walls of the actuation member can be provided with grooves or surface irregularities.

[0013] DE 299 13 854 U1 discloses deceleration de-

vices consisting of a piston that is sliding into a cylinder against the force of an ejection spring, where high-viscosity grease is applied to the cylinder walls.

[0014] DE 298 21 364 U1 discloses deceleration devices consisting of toothed rods sliding into a container and engaging with a toothed wheel connected to the shaft of a rotation decelerator containing high-viscosity oil or grease.

[0015] These known deceleration devices are separate parts that can be autonomously applied to the portions of pieces of furniture.

[0016] A further embodiment of the invention provides for the high-viscosity grease to be applied into a second container, such as for example a decelerator of the known type, inside which a piston slides or a propeller rotates. The piston or propeller are stressed by a contrast member directly or indirectly connected to the pulling member of the closing device.

[0017] Similarly to this last embodiment, it is also possible to provide for the piston or propeller to be stressed by a contrast member directly connected to the actuation member sliding into the guide of the container of the closing device rather than to the pulling member.

[0018] In a preferred embodiment, the contrast member consists of a cursor pivoted on the actuation member and sliding into a longitudinal groove of the container of the closing device through projecting guide strips. The cursor is suitable held into the groove by a cover fastened to the container that at least partly covers it.

[0019] The closing device according to the invention is particularly adapted for the application to portions of pieces of furniture extractable from the body of the piece of furniture through sliding guides, such as for example drawers or the like. It consists of a container fastened to one of the fixed or mobile portions of the guides, wherein there are housed a mechanical energy accumulator and an actuation member sliding into a guide of the container, and of a pulling member respectively fastened to the other side of the sliding guides, which is stressed in the closing direction by the actuation member in the proximity of the introduced portion of the extractable portion of piece of furniture.

[0020] A deceleration system coupled to the closing device is obtained by simply applying a deceleration device of the known type on a side projecting part of the container, which in the action zone of the closing device brakes a contrast member integrally connected to the pulling member.

[0021] Such oil deceleration devices are known, for example, from DE 200 10 282.6 U1, to which reference shall be made for a more detailed description.

[0022] The decelerator can be fastened through a cover with upturned U-shaped transversal section that winds it up and is hooked through sprung tabs at the edges of recesses arranged on the container of the closing device.

[0023] In order to allow the application on the guides both on the right and on the left of the drawer, the con-

trast member consists of an angled plate which carries, on a side, the pulling pin and on the other side, two parallel tabs protruding in symmetrical position with respect to the pulling pin.

[0024] Some embodiment examples are illustrated hereinafter with reference to the attached drawings. In such drawings:

- Figure 1 shows a transversal section of the closing device according to the invention, applied to guides for drawers;
- Figure 2 shows a longitudinal section of the closing device with its essential components;
- Figure 3 shows a variant of the closing device according to Figure 2;
- Figure 4 shows a side view of a portion of the fixed guide according to direction A of Figure 1;
- Figure 5 shows a transversal section of a second embodiment of the closing device with piston deceleration device;
- Figure 6 shows a section of the mobile guide along line VI-VI, in Figure 5;
- Figure 7 shows a longitudinal section of the deceleration device of Figure 5 with its essential components;
- Figure 8 shows a transversal section of a third embodiment of the closing device with rack and toothed-wheel deceleration device;
- Figure 9 shows a section of the mobile guide along line IX-IX of Figure 8;
- Figure 10 shows a side view of the deceleration device of Figure 8;
- Figure 11 shows a transversal section of a fourth embodiment of the closing device with rack deceleration device directly connected to the actuation member;
- Figure 12 shows a top, partly sectioned view of the closing and deceleration device of Figure 11;
- Figure 13 shows a bottom view of the cursor of the device of Figure 12;
- Figure 14 shows a transversal section of a fifth embodiment of the closing device with oil deceleration system and contrast member integrally connected to the pulling member;
- Figure 15 shows a top, partly sectioned view of the closing and deceleration device of Figure 14;
- Figure 16 shows a transversal section of the device of Figure 15 along line XVI-XVI, and
- Figure 17 shows a perspective view of the contrast member directly connected to the pulling member.

[0025] Figure 1 shows a possible arrangement of the closing device applied to an extractable guide for drawers. There is shown a fixed guide 1 screwed to wall 2 of the piece of furniture, on which the extractable guide 4 screwed to drawer 5 slides in a known manner through rollers or 3 balls.

[0026] Container 6 is applied to the fixed guide 1

through hooks 7 that are locked into holes 8 of the fixed guide 1 through the sprung hook 9. Container 6 is below the extractable guide 4, and it exhibits an upper aperture 10 inside which the pulling pin 11 - projecting below the extractable guide 4 - can slide.

[0027] The closing device is in se known, and it consists of container 6 provided with a longitudinal chamber 13 inside which the actuation member 14 slides. Between the inside end of the actuation member 14 and the rear end of chamber 13 there is stretched a helical spring 15 forming a mechanical energy accumulator when the actuation member 14 in its extracted position is hooked through a hooking snug 16 to the front edge 17 of container 6.

[0028] As it can be seen in figure 2, when the drawer is closed in direction of arrow C the pulling pin 11 enters into a recess 18 of the actuation member 14 and, through the effect of its inclined edge, frees the hooking of snug 16 so that spring 15 exerts its tensile force towards the closed position of the drawer.

[0029] In the device according to the invention, along the walls of the longitudinal chamber 13 there is applied a high-viscosity grease 19 that limits the sliding speed of the actuation member 14, thus allowing a soft closing of the drawer.

[0030] In the partial view of figure 3, the actuation member 14 is provided with a projecting part 20 guided into a special side guide 21 of container 6, inside which there is applied the high-viscosity grease 19 so that it forms a suitable reservoir for it.

[0031] The walls of the longitudinal chamber 13 or of the side guide 21, as well as the side surfaces of the actuation member 14 or of the projecting part 20 can be provided with small relieves and grooves to prevent an undesired movement of the grease.

[0032] The embodiment of figure 5 corresponds to that of figure 1 described so far, with the exception that container 6 does not contain grease 16, so the same parts are indicated with the same reference numerals.

[0033] In a suitably selected position in relation to the position of the pulling pin 11, a pallet 22 is fastened to the extractable guide 4 and, during the closing motion of the drawer, it abuts against the elastic cap 23 of an in se known piston decelerator 24 containing high-viscosity grease, for a better description of which reference shall be made to DE 299 13 854 U1.

[0034] Decelerator 24 is illustrated in its essential components in figure 7, and it exhibits a side flange 25 with which it is fastened to the fixed guide 1.

[0035] The embodiment of figure 8 corresponds to that of figure 5, where however the piston decelerator 24 is replaced with the rotating shaft decelerator 26, of the known type as well, whose essential components are illustrated in figure 10.

[0036] Decelerator 26 is connected to the fixed guide 1 through a flange 27, and it consists of a cylindrical chamber 28 from which a shaft 29 protrudes, onto which a gear 30 is keyed. A rack 31 engages with gear 30,

obtained on a wall of the extractable guide 4 and arranged in a suitable manner with respect to the pulling pin 11.

[0037] In the inside portion of the cylindrical chamber 28 filled with high-viscosity oil or grease, shaft 29 carries helical reeds, not shown in the figure, which create the decelerating effect when in contact with the grease.

[0038] In order to facilitate the correct reciprocal arrangement of the component parts, so as to perfectly co-ordinate the action of the closing device with that of the members that cause its deceleration, the embodiment of the invention according to figures from 11 to 13 provides for the gear decelerator 26 to be applied on container 35 laterally to a groove 37 along which the contrast member - consisting of a cursor 38 provided with a rack 39 engaged with gear 30 - is guided. Groove 37 is parallel to the longitudinal chamber 13 inside which the actuation member 44 slides, and it houses guiding strips 41 that protrude from the lower side of the opposed ends of cursor 38. On a side projecting part 40, cursor 38 exhibits a pin 42 that can be introduced into a hole of the actuation member 44 so that the two members are connected in an oscillating manner with one another as shown in figure 12.

[0039] Decelerator 26 and cursor 38 are held onto container 35 by a cover 45 that covers them at least partly.

[0040] Decelerator 26 can suitably be of the unidirectional type, that is to say, such as to exert its action only in the drawer introduction direction, without affecting its extraction movement.

[0041] In the embodiment of the invention according to figures from 14 to 17, a unidirectional oil deceleration device 50 of the known type is used, which in its outside configuration corresponds to a cylinder from which the shank 48 of a piston protrudes; in turn provided with an elastic cap 49.

[0042] The deceleration device 50 is applied on a side projecting part 51 of the container of the closing device, which essentially corresponds, in its constituting parts, to the closing device of figure 2 and is similarly applied to the fixed guide 1 of the drawer through side hooks 7.

[0043] Decelerator 50 is held on the side projecting part 51 of the container in suitable position with respect to the actuation member 14 so that the contrast member connected to the extractable guide 4 abuts against the elastic cap 49 soon after the pulling pin 11, in its closing movement, has released the actuation member 14 from edge 17 of container 6.

[0044] Decelerator 50 is surrounded by a cover 52 having an upturned U transversal section that is hooked through sprung tabs 53 at edges 54 on the container of the closing device.

[0045] The contrast member fastened to the extractable guide 4 of the drawer or the like, consists of a right angle plate 55, 56 on a side 55 of which there is fastened the pulling pin 11, whereas on the other side 56, two tabs 57, parallel with one another, arranged in a sym-

metrically spaced position with respect to the pulling pin 11, protrude perpendicularly so as to allow the application of the same plate both on the right side and on the left side guide of the drawer.

Claims

1. Closing device for sliding portions of pieces of furniture consisting of a container (6) fastened to the fixed or to the sliding portion of the piece of furniture wherein there are housed a mechanical energy accumulator (15) and an actuation member (14) sliding into a guide (13) of the container, and of a pulling member (11), respectively on the other side of the piece of furniture, which interacts with the actuation member (14), **characterised in that** the actuation member is directly or indirectly slowed in its movement by a high-viscosity grease (19).
2. Closing device according to claim 1, **characterised in that** the high-viscosity grease (19) is applied to the walls of the guide (13) of the container (6).
3. Closing device according to claim 1 or 2, **characterised in that** the actuation member (14) exhibits a projecting part (20) sliding into a special guide (21) of the container (6) provided with grease (19).
4. Closing device according to one of claims from 1 to 3, **characterised in that** the walls of the guide (13, 20) of the container (6) are provided with small projecting parts or grooves.
5. Closing device according to one of claims from 1 to 4, **characterised in that** the walls of the actuation member (14) are provided with grooves or surface irregularities.
6. Closing device according to claim 1, **characterised in that** the grease is applied in a known manner into a second container (24, 26) inside which a piston slides or a propeller rotates, and **in that** the piston or the propeller are stressed by a contrast member (22, 31) directly or indirectly connected to the pulling member (11) of the closing device.
7. Closing device according to claim 1, **characterised in that** the grease is applied in a known manner into a second container (24, 26) inside which a piston slides or a propeller rotates, and **in that** the piston or the propeller are stressed by a contrast member directly connected to the actuation member (44) sliding into the guide (13) of the container (6, 35) of the closing device.
8. Closing device according to claim 7, **characterised in that** the contrast member consists of a cursor

(38) pivoted on the actuation member (44) and sliding into a longitudinal groove (37) of the container (35) of the closing device through protruding guiding strips (41).

9. Closing device according to claim 8, **characterised in that** the cursor (38) is held into the groove (37) by a cover (45) fastened to the container (35) that at least partly covers it.

10. Closing device for portions of pieces of furniture extractable from the body of the piece of furniture through sliding guides (1, 4), consisting of a container (6) fastened to one of the fixed or mobile portions of the guides, wherein there are housed a mechanical energy accumulator (15) and an actuation member (14) sliding into a guide of the container, and of a pulling member (11) respectively fastened to the other side of the sliding guides, which is stressed in the closing direction by the actuation member in the proximity of the introduced portion of the extractable portion of piece of furniture, **characterised in that** on a side projecting part (51) of the container (6) there is applied an oil deceleration device (50) of the known type, which in the action zone of the closing device brakes a contrast member (55, 56) integrally connected to the pulling member (11).

11. Closing device according to claim 10, **characterised in that** the decelerator (50) is fastened through a cover (52) having upturned-U transversal section, that surrounds it, and is hooked through sprung tabs (53) to the edges (54) of recesses on the container (51) of the closing device.

12. Closing device according to claim (10), **characterised in that** the contrast member consists of an angled plate (55, 56) carrying on a side the pin (11) forming the pulling member and on the other side, two protruding parallel tabs (57) arranged in symmetrical position with respect to the pulling pin (11).

The above as substantially described, illustrated, claimed and for the specified purposes.

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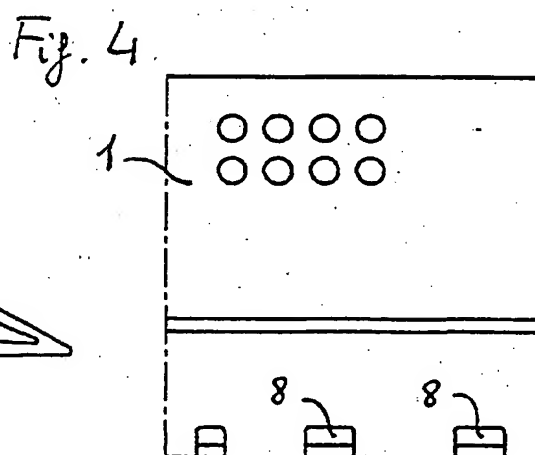
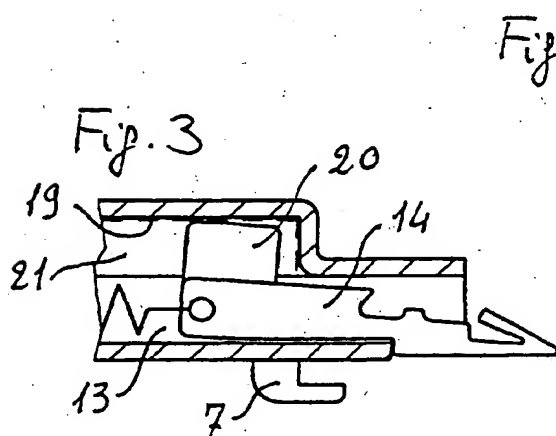
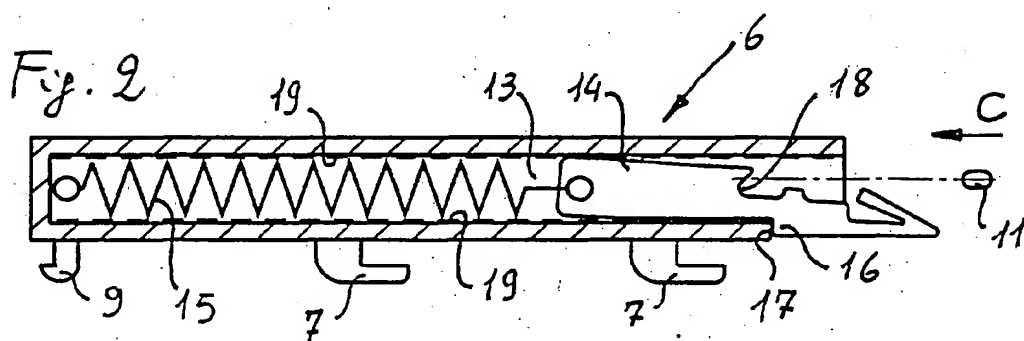
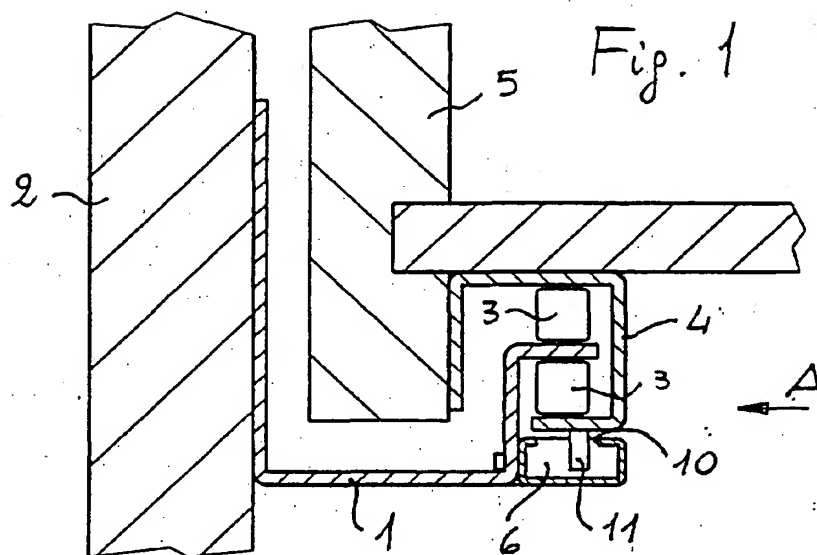
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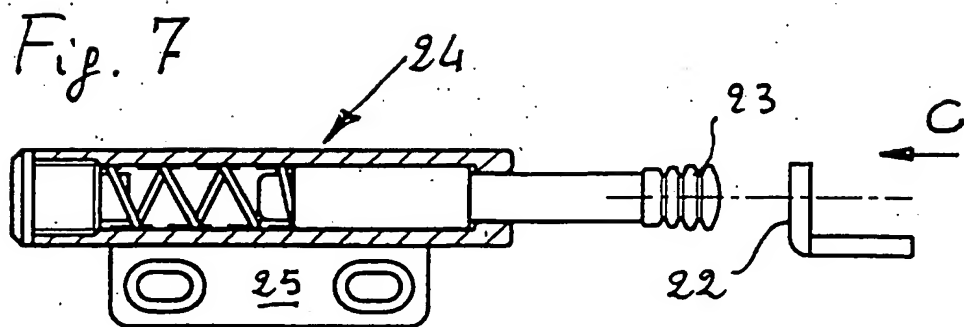
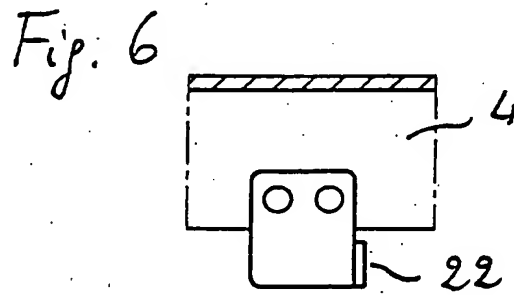
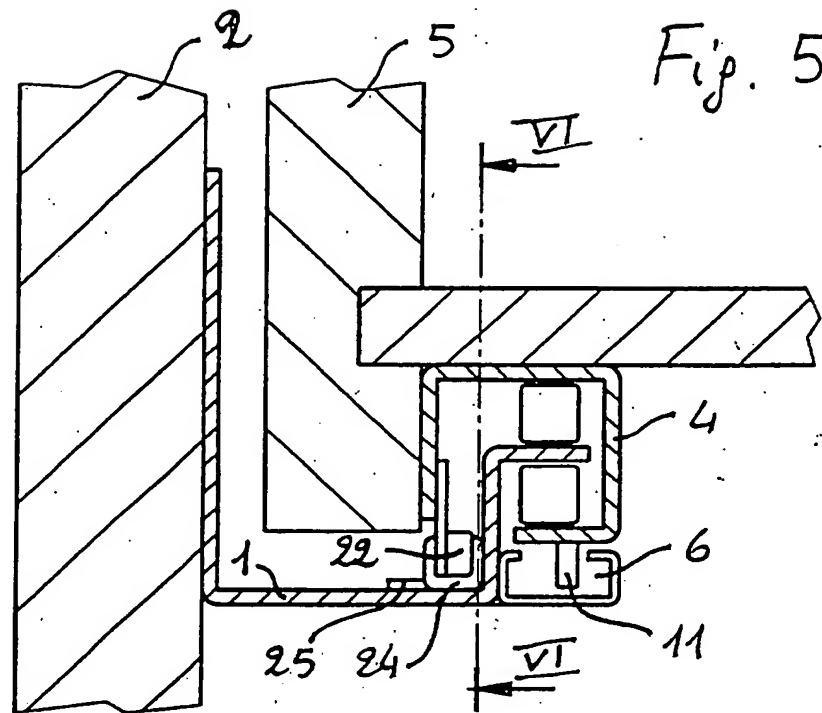
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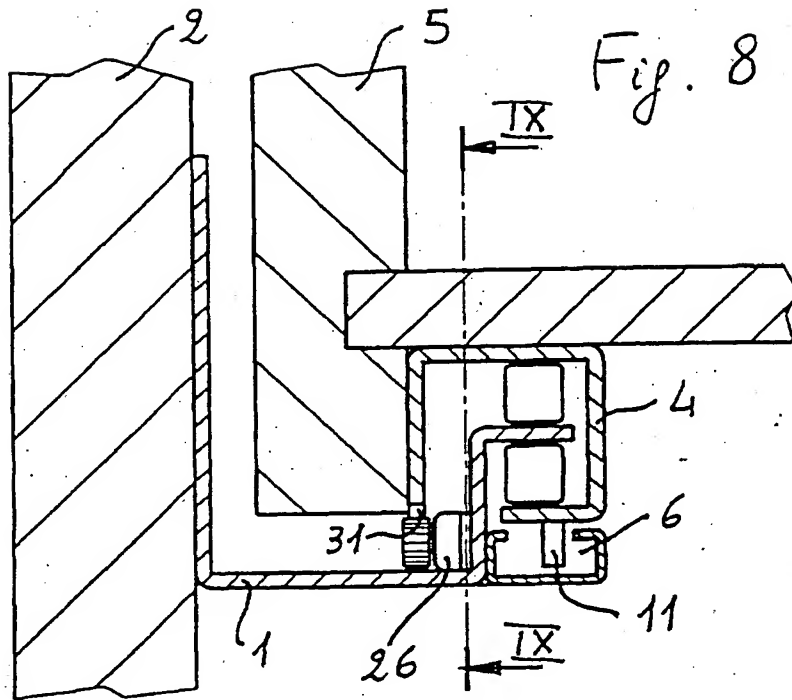


Fig. 9

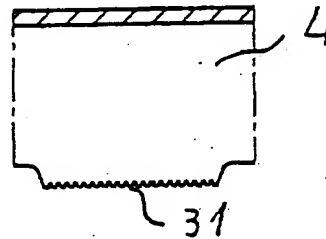


Fig. 10

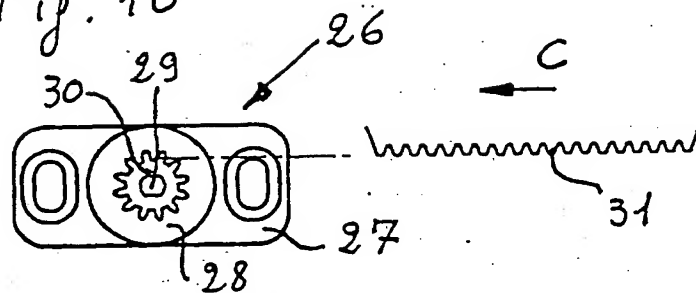


Fig. 11

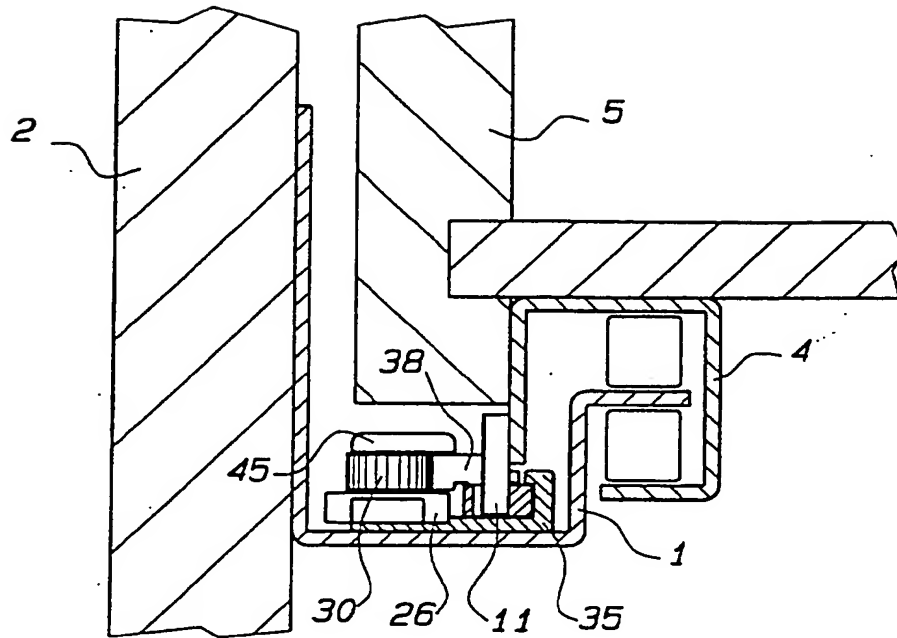


Fig. 12

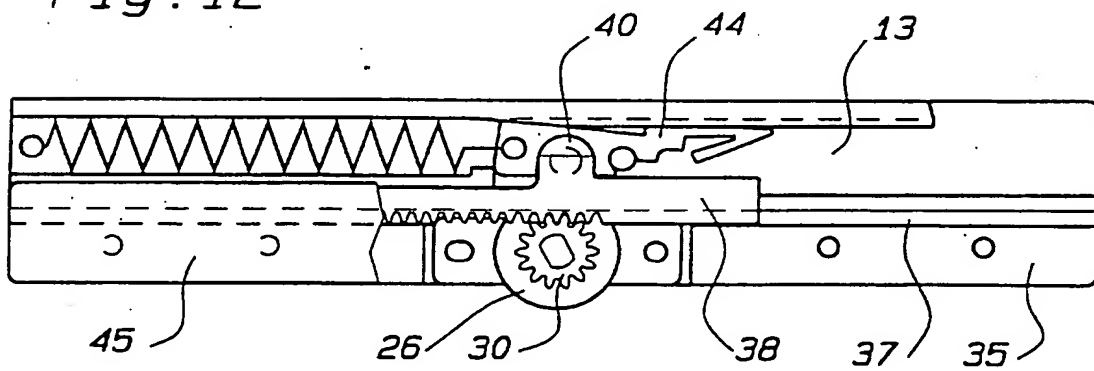


Fig. 13

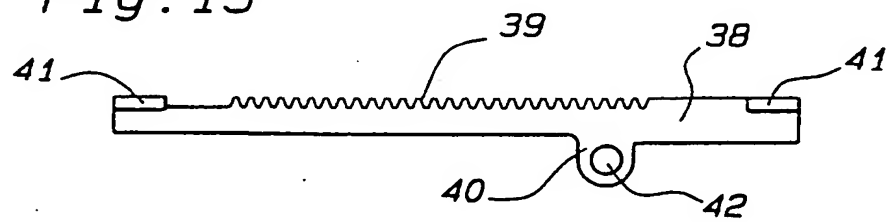


Fig. 14

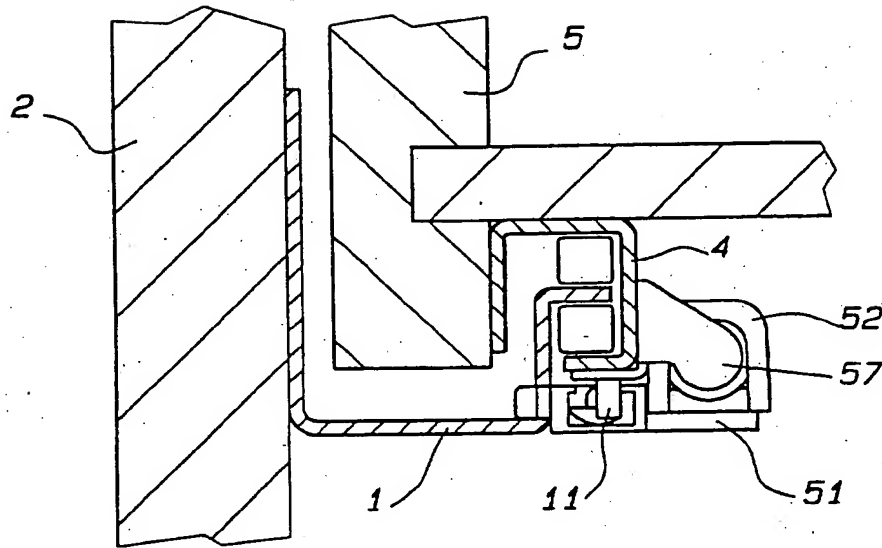
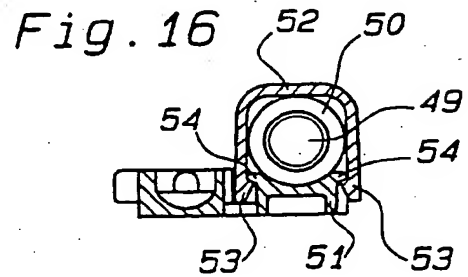
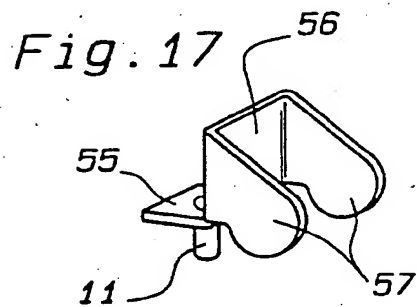
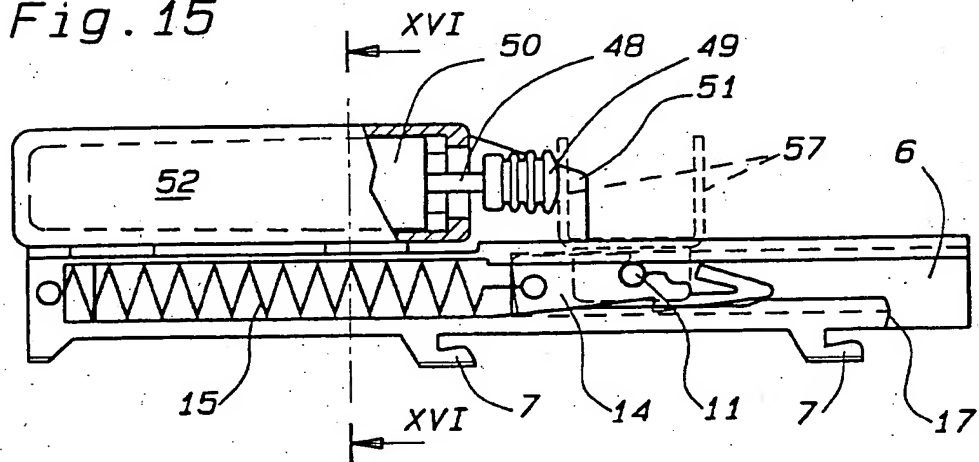


Fig. 15





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EUROPEAN SEARCH REPORT

Application Number
EP 01 11 1420

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
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			TECHNICAL FIELDS SEARCHED (Int.CI.7)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5. October 2001	Examiner Ottesen, R
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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